

ENVIRONMENTAL ENGINEERING

Environmental engineering applies engineering and scientific principles to protect and preserve human health and the environment. It embraces broad environmental concerns, including air and water quality, solid and hazardous wastes, groundwater protection and remediation, water resources management, environmental policy, radiological health, environmental biology and chemistry, systems ecology, water and wastewater treatment and wetlands ecology.

About this Program

- **College:** Herbert Wertheim College of Engineering
- **Degree:** Bachelor of Science in Environmental Engineering
- **Credits for Degree:** 128
- **Additional Information**
- **Related Environmental Engineering Programs**

To graduate with this major, students must complete all university, college, and major requirements.

Department Recommendations

All students are strongly encouraged to take the Fundamentals of Engineering Exam which is the first exam leading to licensure as a professional engineer. Application should be made in the semester before graduation.

Qualified students are encouraged to pursue master's and doctoral studies to increase their knowledge and broaden their employment opportunities.

Educational Objectives

Environmental engineering graduates will continue to develop and apply their knowledge and skills to identify, prevent, and solve environmental problems. Evidence of achievement of this objective includes one or more of the following:

- Passing the Fundamentals of Engineering Examination
- Obtaining and maintaining a Professional Engineering License
- Admission to graduate school, including medical, law or other professional schools
- Completing educational and professional short courses

Program graduates can aspire to careers that benefit society as a result of their educational experiences in science, analysis and design, as well as in their social and cultural activities. Evidence of achievement of this objective includes the following:

- Employment as an engineer or in a related technical capacity
- Participating in professional organizations
- Providing community service

Program graduates will be able to communicate and work effectively in all work settings including those that are multidisciplinary. Evidence of achievement of this objective includes one or more of the following:

- Publication in scientific and engineering journals
- Presenting at scientific and engineering conferences

- Teaching
- Contributing to scientific and engineering studies
- Service as a task or team leader

Mission

The mission of the Department of Environmental Engineering Sciences (EES) is to provide quality undergraduate and graduate educational programs in environmental engineering sciences, to conduct an internationally recognized environmental research program that benefits humanity, and to provide authoritative guidance to individuals and organizations charged with preventing and solving local, state, national and global environmental problems. EES serves as a leader in interdisciplinary programs aimed at solving environmental problems and as a major on campus crucible for identification, conceptualization and resolution of environmental issues.

Related Environmental Engineering Programs

- Combined Degree

Critical Tracking

Critical Tracking records each student's progress in courses that are required for entry to each major. Please note the critical-tracking requirements below on a per-semester basis.

Equivalent critical-tracking courses as determined by the State of Florida Common Course Prerequisites may be used for transfer students.

Semester 1

- Complete 1 critical-tracking course (CHM 2045 or CHM 2095, CHM 2046 or CHM 2096, MAC 2311, MAC 2312, MAC 2313, MAP 2302, PHY 2048 and PHY 2049) with a minimum grade of C within two attempts, including withdrawals.
- 2.5 GPA on the best of a maximum of two attempts at each critical-tracking course
- 2.0 UF GPA required

Semester 2

- Complete 1 additional critical-tracking course with a minimum grade of C within two attempts, including withdrawals
- 2.5 GPA on the best of a maximum of two attempts at each critical-tracking course
- 2.0 UF GPA required

Semester 3

- Complete 2 additional critical-tracking courses with minimum grades of C within two attempts, including withdrawals
- 2.5 GPA on the best of a maximum of two attempts at each critical-tracking course
- 2.0 UF GPA required

Semester 4

- Complete 2 additional critical-tracking courses with minimum grades of C within two attempts, including withdrawals

- 2.5 GPA on the best of a maximum of two attempts at each critical-tracking course
- 2.0 UF GPA required

Semester 5

- Complete the remaining critical-tracking courses with minimum grades of C in each course within two attempts, including withdrawals
- 2.5 GPA on the best of a maximum of two attempts at each critical-tracking course
- 2.0 UF GPA required

Model Semester Plan

Students are expected to complete the general education International (GE-N) and Diversity (GE-D) requirements. This is often done concurrently with another general education requirement (typically, GE-C, H, or S).

To remain on track, students must complete the appropriate critical-tracking courses, which appear in bold. These courses must be completed by the terms as listed above in the Critical Tracking criteria.

This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student's academic record and scheduling availability of courses. Prerequisites still apply.

Course	Title	Credits
Semester One		
Select one:		3
CHM 2045	General Chemistry 1 (Critical Tracking ; Gen Ed Physical Sciences)	
CHM 2095	Chemistry for Engineers 1 (Critical Tracking ; Gen Ed Physical Sciences)	
CHM 2045L	General Chemistry 1 Laboratory (Gen Ed Physical Sciences)	1
IUF 1000	What is the Good Life (Gen Ed Humanities)	3
MAC 2311	Analytic Geometry and Calculus 1 (Critical Tracking ; State Core Gen Ed Mathematics)	4
State Core Gen Ed	Social and Behavioral Sciences	3
	Credits	14
Semester Two		
Select one:		3
CHM 2046	General Chemistry 2 (Critical Tracking ; Gen Ed Physical Sciences)	
CHM 2096	Chemistry for Engineers 2 (Critical Tracking ; Gen Ed Physical Sciences)	
CHM 2046L	General Chemistry 2 Laboratory (Gen Ed Physical Sciences)	1
Select one:		3
ENC 1101	Expository and Argumentative Writing (Gen Ed Composition)	
ENC 1102	Argument and Persuasion (Gen Ed Composition)	
MAC 2312	Analytic Geometry and Calculus 2 (Critical Tracking ; Gen Ed Mathematics)	4
State Core Gen Ed	Humanities	3
	Credits	14
Semester Three		
ENC 3246	Professional Communication for Engineers (State Core Gen Ed Composition; minimum grade of C required)	3

MAC 2313	Analytic Geometry and Calculus 3 (Critical Tracking ; Gen Ed Mathematics)	4
PHY 2048	Physics with Calculus 1 (Critical Tracking ; State Core Gen Ed Physical Sciences)	3
PHY 2048L	Laboratory for Physics with Calculus 1 (Gen Ed Physical Sciences)	1
Gen Ed Social and Behavioral Sciences		3
	Credits	14

Semester Four		
EES 4203	Phase Partitioning in the Environment	4
EGM 2511	Engineering Mechanics: Statics	3
MAP 2302	Elementary Differential Equations (Critical Tracking)	3
PHY 2049	Physics with Calculus 2 (Critical Tracking)	3
PHY 2049L	Laboratory for Physics with Calculus 2	1
	Credits	14

Summer After Semester Four		
CGN 3501C or EMA 3010	Civil Engineering Materials or Materials	3-4
STA 3032	Engineering Statistics	3
Technical elective ¹		3
	Credits	9-10

Semester Six		
EES 4201	Water Chemistry	3
EGM 3400	Elements of Dynamics	2
ENV 3040C	Computational Methods in Environmental Engineering	3
ENV 4041C	Environmental Analysis	3
Engineering graphics or geographic information systems elective		3
	Credits	14

Semester Seven		
CWR 3201	Hydrodynamics	4
EES 4102	Wastewater Microbiology	2
ENV 4101	Elements of Atmospheric Pollution	3
ENV 4514C	Water and Wastewater Treatment	3
	Credits	12

Semester Eight		
ENV 4121	Air Pollution Control Design	3
ENV 4351	Solid and Hazardous Waste Management	4
ENV 4501	Environmental Hydrology 1	3
ENV 4561	Hydraulic Systems Design	3
	Credits	13

Semester Nine		
ENV 3930	Environmental Engineering Ethics Seminar	1
ENV 4506	Environmental Hydrology 2	3
ENV 4601	Environmental Resources Management	2
Sustainability elective		3
Technical elective ¹		3
	Credits	12

Semester Ten		
EES 4005C	Ecological Engineering	3
Capstone design elective		3
Technical electives ¹		6
	Credits	12
	Total Credits	128

¹ Technical elective: Any EES/ENV course not specified above, except EES 3000L.

Approved Electives

Sustainability Elective

Code	Title	Credits
CGN 4905	Special Problems in Civil Engineering (Sustainable Engineering)	3
EES 3008	Energy and Environment	3
EES 4050	Environmental Planning and Design	3
ENV 4932	Special Problems in Environmental Engineering Sciences (The Science, Policy and Economics of Recycling)	3
ENV 4932	Special Problems in Environmental Engineering Sciences (Sustainable Nanotechnology 2)	3

Engineering Graphics or Geographic Information Systems Elective

Code	Title	Credits
CGN 2328	Technical Drawing and Visualization	3
EML 2023	Computer Aided Graphics and Design	3
GIS 3043	Foundations of Geographic Information Systems	4
GIS 3072C	Geographic Information Systems	3
URP 4273	Survey of Planning Information Systems	3

Capstone Design Elective

Code	Title	Credits
ENV 4300	Solid Waste Containment Design	3
ENV 4122	Design of Air Pollution Control System	3
ENV 4353	Solid Waste Systems Design	3
ENV 4432	Potable Water System Design	3
ENV 4532	Wastewater System Design	3
ENV 4913	Integrated Product and Process Design 2: Environmental Engineering Sciences ¹	3

¹ By application only. The ENV 4912/ENV 4913 sequence counts as a technical elective and the capstone design elective. Both courses must be completed to receive credit.

Academic Learning Compact

Environmental engineering applies engineering and scientific principles to protect and preserve human health and the environment. It embraces broad environmental concerns, including air and water quality, solid and hazardous wastes, groundwater protection and remediation, water resources and management, environmental policy, radiological health, environmental biology and chemistry, systems ecology, water and wastewater treatment and wetlands ecology.

Accredited by the Engineering Accreditation Commission of ABET.

Before Graduating Students Must

- Pass assessment by two or more faculty and/or industrial practitioners of student performance on a major design experience.
- Pass assessment in two courses of individual assignments targeted to each particular learning outcome. Assessment will be provided by the instructor of the course according to department standards.
- Complete an exit interview in your final semester.
- Complete requirements for the baccalaureate degree, as determined by faculty.

Students in the Major Will Learn to Student Learning Outcomes (SLOs)

Content

1. Apply knowledge of mathematics, science and engineering principles to environmental engineering problems.
2. Design and conduct environmental engineering experiments and analyze and interpret the data collected.

Critical Thinking

3. Design an environmental engineering system, component or process to meet desired needs within realistic economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability constraints.

Communication

4. Communicate technical data and design information effectively in writing and in speech to project stakeholders.

Curriculum Map

I = Introduced; R = Reinforced; A = Assessed

Courses	SLO 1	SLO 2	SLO 3	SLO 4
CHM 2046	I			
CHM 2046L		I		
EES 4102L		A		R
EES 4103		R		
EES 4201	A	R		
EES 4203	R	R		
EMV 3040C	A			
EMV 4121			R	
EMV 4514C			I	A
ENC 3254				I
ENV 4041C		A		R
ENV 4514C			I	A
Capstone Design Elective			A	A
ENV 4122 or ENV 4353 or ENV 4432 or ENV 4532 or ENV 4913				
FE Exam	A		A	
Exit Interview	A	A	A	A

Assessment Types

- Assignments
- Reports
- The Fundamentals of Engineering (FE) exam
- Exit survey